

B.Sc First year Zoology (Honours)

Paper-1

Cephalic Appendages:

There are five pairs of cephalic appendages: the antennules, the antennae, the mandibles, the maxillulae and the maxillae. The antennule (first antenna) is situated in front of the mouth just behind the base of the eye-stalk. Its protopodite consists of three segments: precoxa, coxa and basis.

The procoxa is very large and carries a spine on its outer side. There is a shallow depression on its dorsal surface, bearing the opening of the statocyst. The statocyst is a small cuticular sac which lies within the precoxa; it is the balancing organ of the prawn. The coxa is short; it is provided with sensory hairs or setae.

The basis is slightly longer than the coxa and carries a pair of many jointed feelers or flagella. The outer feeler is divided into two branches, of which the smaller inner branch contains olfactory setae for the purpose of smelling. The two feelers are modified exo and endopodites of the protopodite.

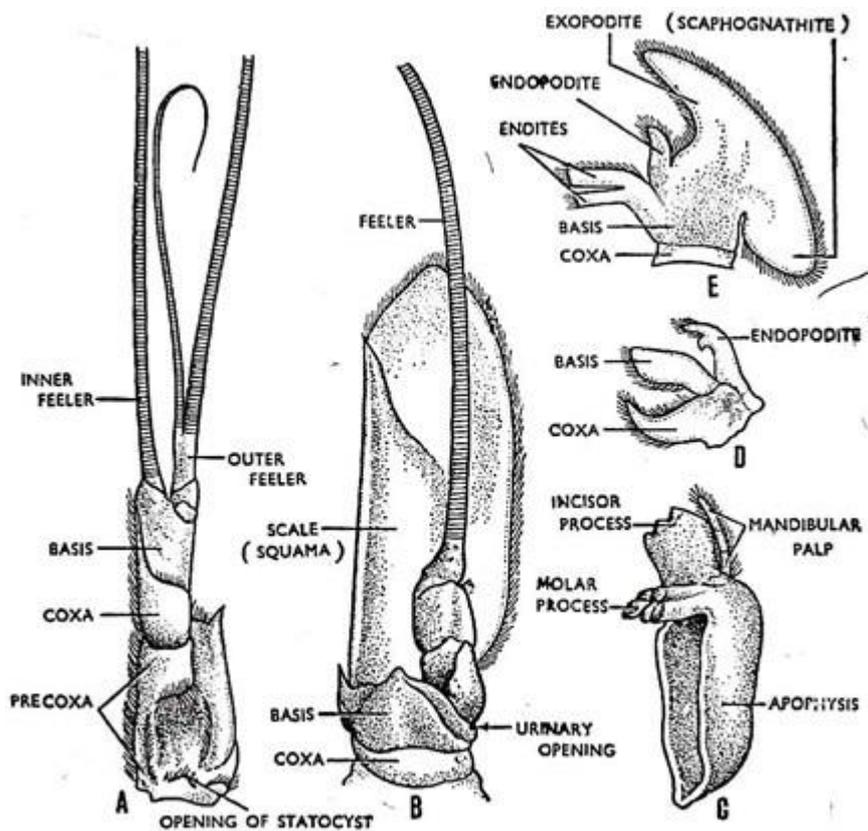
The antenna (second antenna) is also pre-oral in position. Its peduncle or protopodite consists of two segments: coxa and basis. The excretory organ or green gland is lodged inside the coxa, and the urinary opening or renal aperture is situated on its inner margin.

The basis gives off two rami—a leaf-like scale or squama and a long many-jointed flagellum or feeler. The squama represents the exopodite and help the prawn as a balancer in swimming. The flagellum bears tactile setae and represents the endopodite.

Mandible:

It is the third appendage and lies on the outer side of the mouth. Its spoon-shaped proximal part is called the apophysis, while the solid distal part is the head. The head consists of a stout molar process and a thin incisor process.

The molar process is placed at right angles to the apophysis and carries 5 to 6 yellowish- brown teeth. The incisor process is placed in front of the oral aperture and bears three closely set whitish teeth. A three-jointed mandibular palp arises from the outer side of the head; it bears sensory setae and lies against the outer side of the incisor process.



Cephalic appendages of the right side; A=Antennule, B=Antenna, C=Mandible, D=Maxillula, and E=Maxilla.

The coxa of the protopodite is modified to form the apophysis and the head of the mandible. The basis of the protopodite corresponds to the proximal segment of the palp and the endopodite is represented by the two distal segments of the same. The exopodite is absent. The mandible serves as a cutting and crushing apparatus.

Maxillula (First Maxilla):

It is the smallest of all the appendages and is placed behind the posterior lip of the mouth. The maxillula consists of three foliaceous plates, the margins of which are covered with sensory setae.

Of the three plates, the two directed inwards are the jaws or gnathobases; these are the coxa and basis of the protopodite. The third, directed outwards represents the endopodite. The exopodite is absent. The maxillula helps to push food into the mouth.

Maxilla (Second Maxilla):

It is a thin foliaceous appendage placed behind the maxillula. Its peduncle consists of a much reduced coxa and a larger bifurcated basis which projects inward is the endites or jaws. The large fan-shaped exopodite is known as the scaphognathite; it lies in front of the gill-chamber.

The small endopodite is placed between the exopodite and the endites. The maxilla has a two-fold function. The endites are used to push food into the oral cavity. The scaphognathite helps in respiration by maintaining a constant flow of water through the gill-chamber.

Thoracic Appendages:

These consist of three pairs of maxillipedes or foot-jaws and five pairs of walking legs.

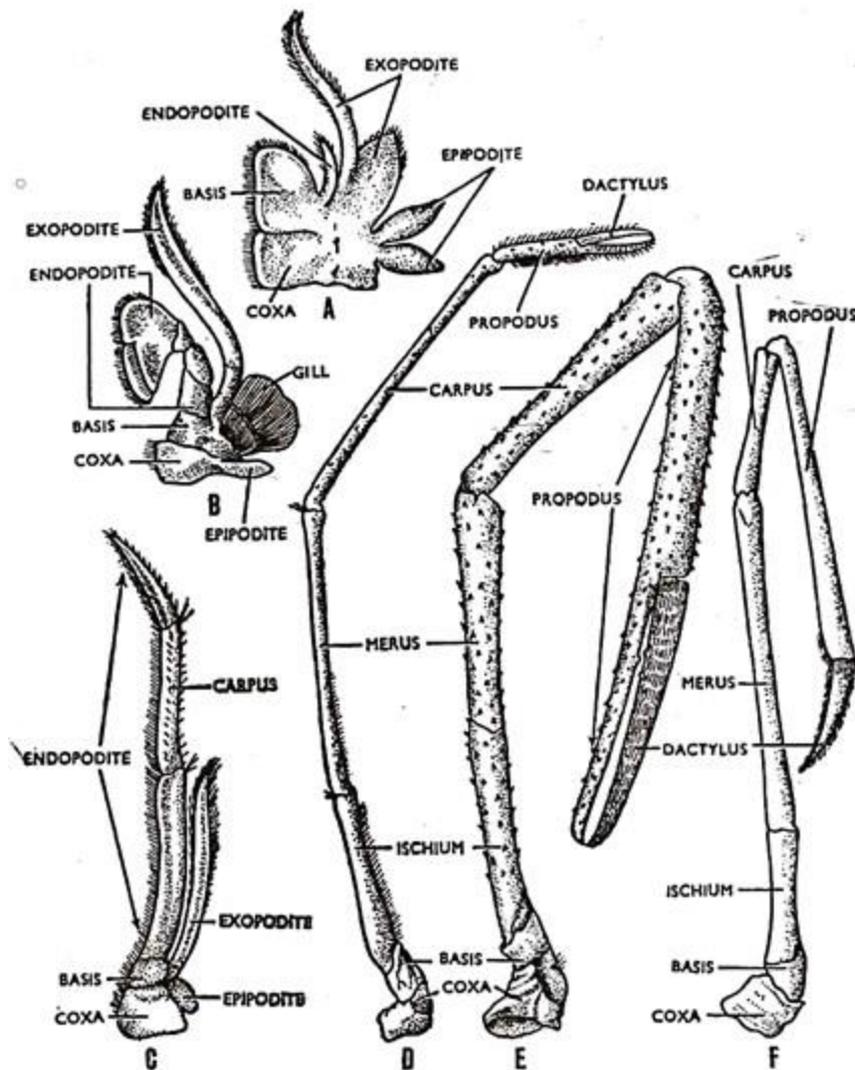
The first maxillipede has a protopodite consisting of two segments, coxa and basis. These are flattened leaf-like structures carrying stiff setae on their inner margins. They push food into the mouth. Attached to the outer side of the coxa, there is a bilobed structure called epipodite which helps in respiration. The endopodite is short but the exopodite is long and provided with a thin expansion at its base.

The second maxillipede is less foliaceous than the first. Its protopodite consists, as usual, of coxa and basis. The coxa is short and covered with setae on its inner margin; it carries a small epipodite and a gill on its outer margin.

The basis is immovably articulated to the endopodite. The exopodite is long, slender, un-jointed and whip-like. The endopodite consists of five segments, namely, ischium, merus, carpus, pro-podus and dactylus. The proodus and the dactylus are bent and turned backwards forming a knife-like cutting plate.

The third maxillipede is pediform or leg-like in appearance. Its protopodite consists of coxa and basis. The coxa carries a thin exopodite on its outer side. There is a slender un-jointed exopodite attached to the outer side of the basis and bearing stiff setae.

The endopodite is three-jointed—ischium being fused with the merus, and pro-podus with dactylus, while the carpus remains free, forming the middle segments of the end and pro-podus with the dactylus, while the dactylus, while the remain free, forming the middle segment of the endopodite.



Thoracic Appendages of the right side; A=first maxilliped, B=second maxilliped, C=third maxilliped, D=first walking leg (small chela), E=second walking leg (large chela), F=a non-chelate walking leg. Third, fourth and fifth walking legs are similar to F.

Walking Legs:

The prawn is decapod (deca= ten) bearing ten walking legs. Even walking leg consists of seven cylindrical segments joined end to end. The first two segments represent the coxa and basis of the protopodite and the remainder represent the five segments of the endopodite. The exopodite is absent. The five segments of the endopodite are: ischium, merus, carpus, pro-podus and dactylus, the last being clawed.

The first and second walking legs carry pincers at their proximal ends; hence they are known as the chelate legs. The last three legs are non-chelate. The second walking leg is very much larger and bears spines and setae.

It is, therefore, known as the large chela, whereas the first walking leg is known as the small chela. The walking legs help the prawn to crawl upon the river bed. The chelate legs are organs for offence and defence and help in holding the food before being taken. Gonopores are situated at the bases of the third walking legs in female; but in male, they lie at the bases of the fifth walking legs.